VICI

Visualisation of Collaboration in Social Enterprise Software Systems

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Abstract

This poster describes the relationship visualisation framework VICI. VICI was developed to extract co-author relationships found on an Atlassian Confluence installation and visualise them as network graphs. Therefore wiki-entries are extracted directly from the Confluence database using sql-queries. This data is used to calculate co-authorship bigrams and build a relationship graph. The graph is then visualised as force-directed network graph using D3.js in a web app. Node size and colour as well as path width and colour are used to encode relationship degrees and author activity. Additional relationship visualisations will be developed in the future.

Keywords: information retrieval; data visualisation; knowledge management; software development

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1 Introduction

In cooperation with a project partner, the Coltero project[1] aims to extract key performance indicators from the social collaborative knowledge management software Atlassian Confluence[2] and use them to develop a knowledge sharing incentive system.

With VICI, a first step was made to extract and visualise co-authorship relations from wiki entries in Confluence. The visualisation was already used to monitor the participation rate of the employees and thus estimating the degree of acceptance of the social enterprise software.

2 Architecture and methods

VICI is composed of a Python[3] based backend system that extracts the data and calculates the relationships needed for the visualisations, and a web based frontend that displays the relationship graph and allows some user interaction with the graph as well as the backend system.

2.1 Data extraction

At the moment VICI focuses on the wiki-entries written in the Confluence wikis. The data extraction has to take into account that Confluence does not only store the latest version of a wiki-entry but also all its revisions. These revisions are linked by id numbers.

2.2 Calculating the relationship graph

Since every author of a wiki-entry is a co-author of every other author of the same wiki entry, a combination *([A, B, C] → [[A, B], [A, C], [B, C]])* of all

1 http://www.htwchur.ch/digital-science/forschung-und-dienstleistung/institut-sii/projekt-uebersicht/coltero-collaboration-and-enterprise-knowledge-visualisation.html

2 https://atlassian.com/software/confluence

3 https://www.python.org

the authors per wiki-entry is calculated. These bigrams are then entered with additional data like edge weight into a NetworkX[4] graph.

2.3 Visualising the graph

The frontend graph visualisation uses the D3.js[5] library to build a force-directed graph. Authors are displayed as nodes, and the relationship between them are shown as links between these nodes.

2.4 Web framework

In order to run the whole pipeline, a small web application was built using the Flask[6] microframework. This application fetches and calculates the needed data, provides a web interface to display the visualisation and offer the option to switch between different databases.

3 Future development

Future development of VICI will include graphic and algorithmic improvements to the existing framework as well as the development of algorithms to display new relationships.

4 https://networkx.github.io

5 https://d3js.org

6 http://flask.pocoo.org